

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 to 15 (canceled)

Claim 16 (currently amended): A dialysis catheter comprising:

a connection section having an inflow port to a patient inflow lumen, and an outflow port to a patient outflow lumen;

a patient inflow section extending from the connection section and having a patient inflow opening to the patient inflow lumen;

a separation section extending from the patient inflow section, which is substantially straight when in an unstressed condition; and

a patient outflow section extending from the separation ~~section and section~~, having a patient outflow opening to the patient outflow lumen, and wherein when the catheter is in a substantially unstressed condition, (i) the connection section is substantially straight and (ii) the patient inflow section is curved.

Claim 17 (canceled):

Claim 18 (currently amended): The dialysis catheter of ~~claim 17~~ claim 16, wherein the patient outflow section is coiled.

Claim 19 (currently amended): The dialysis catheter of ~~claim 17~~ claim 16, wherein the patient outflow section is substantially straight.

Claim 20 (original): The dialysis catheter of claim 16, wherein the patient inflow section is an uppermost portion of an implantable portion of the catheter and the patient outflow section is a lowermost portion of the implantable portion of the catheter.

Claim 21 (original): The dialysis catheter of claim 16, wherein the connection section, patient inflow section, separation section, and patient outflow section further comprise a flexible tube having an internal septum between the patient inflow and outflow lumens.

Claim 22 (original): The dialysis catheter of claim 16, wherein the patient inflow section has a curved shape.

Claim 23 (original): The dialysis catheter of claim 16, wherein the patient inflow opening to the patient inflow lumen is in a direction away from the patient outflow opening to the patient outflow lumen.

Claim 24 (original): The dialysis catheter of claim 16, wherein the catheter comprises a single tube having the patient inflow and outflow lumens, and wherein the tube transitions from having both the patient inflow and outflow lumens to having only the patient outflow lumen at a location between the patient inflow section and a distal catheter end.

Claims 25 to 28 (canceled)

Claim 29 (previously presented): A dialysis catheter comprising:
a substantially straight connection section;
a non-linear patient inflow section extending from the connection section;
a separation section extending from the patient inflow section, the separation section having a substantially straight shape when in an unstressed condition;
a patient outflow section extending from the separation section;
a patient inflow lumen extending from the connection section to the patient inflow section; and
a patient outflow lumen extending from the connection section to the patient outflow section.

Claim 30 (canceled).

Claim 31 (original): The dialysis catheter of claim 29, wherein the patient outflow section has a coiled shape.

Claim 32 (original): The dialysis catheter of claim 29, wherein the patient inflow section has a curved shape of about 180°.

Claim 33 (previously presented): A peritoneal dialysis catheter having first and second lumens, comprising:

- a dialysis machine connection section having fluid ports to the first and second lumens;

- a non-linear section extending from the connection section and having a fluid port to the first lumen;

- a separation section extending from the non-linear section, the separation section preformed to be substantially straight when in an unstressed condition; and

- a distal end section extending from the separation section and having a fluid port to the second lumen.

Claim 34 (original): The peritoneal dialysis catheter of claim 33, wherein the first lumen is a patient inflow lumen and the second lumen is a patient outflow lumen.

Claim 35 (original): The peritoneal dialysis catheter of claim 33, wherein the non-linear section has a curved shape and the fluid port in the non-linear section is pointed in a direction opposite the fluid port in the distal end section.

Claim 36 (withdrawn): A method of flowing fluid through a catheter comprising the steps of:

- flowing fluid into a first lumen at a proximal end of the catheter;

flowing the fluid in the first lumen to a curved path of the first lumen;
flowing the fluid in the curved path through a fluid opening in the curved path and out of the catheter;
flowing the fluid which exited the catheter from the opening in the curved path into a second lumen at a distal end of the catheter; and
flowing the fluid in the second lumen to a fluid opening at the proximal end of the catheter and out of the catheter.

Claim 37 (withdrawn): A method of implanting a catheter into a patient comprising the steps of:

straightening the catheter with a stylet inside of the catheter;
inserting a distal end of the straightened catheter through an entrance incision into a peritoneal cavity of the patient while directing the straightened catheter downward;
removing part of the stylet from the catheter while advancing the catheter into the peritoneal cavity until the distal end is located in a lower area of the peritoneal cavity and a distal implant cuff is seated in a rectus muscle of the patient;
rotating a portion of the stylet and catheter outside of the patient downward and a portion of the stylet and catheter inside of the patient upward; and
pulling the catheter through a subcutaneous tunnel having an exit site below the entrance incision.

Claims 38 to 43 (canceled)

Claim 44 (previously presented): A dialysis system, comprising:
a fluid flow system capable of conveying fluid to and from a patient; and
a catheter having first and second lumens fluidly connected to the fluid flow system, the catheter having a tube extending from an external proximal end to a single implantable free distal end, the tube having patient inflow and outflow portions spaced from each other along the tube, the patient in-flow portion having a preformed non-linear

shape, and wherein the patient inflow portion is connected to the patient outflow portion by a substantially straight portion when in an unstressed condition.

Claim 45 (previously presented): The dialysis system of claim 44, wherein the fluid flow system is a continuous flow dialysis system.

Claim 46 (previously presented): The dialysis system of claim 44, wherein the fluid flow system is an automated continuous flow peritoneal dialysis system.

Claim 47 (previously presented): The dialysis system of claim 44, wherein the tube is so positioned and arranged when in use in a peritoneal cavity that fluid exits the catheter from the patient inflow portion to an upper area of the peritoneal cavity, flows across a portion of the peritoneal cavity, and re-enters the catheter at the patient outflow portion at a lower area of the peritoneal cavity.

Claim 48 (previously presented): The dialysis system of claim 44, wherein the patient inflow portion is fluidly connected to the first lumen, and the patient outflow portion is fluidly connected to the second lumen, and wherein when the dialysis system is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

Claim 49 (canceled).

Claim 50 (previously presented): The dialysis system of claim 44, wherein the patient inflow and outflow portions are located at opposite upper and lower portions of an implantable portion of the catheter.

Claim 51 (previously presented): The dialysis system of claim 44, wherein the patient inflow portion has a generally arcuate shape.

Claim 52 (previously presented): The dialysis system of claim 44, wherein the tube is a single tube having the first and second lumens.

Claim 53 (previously presented): A peritoneal dialysis system, comprising:
a fluid flow system capable of conveying fluid to and from a patient; and
a catheter having first and second lumens fluidly connected to the fluid flow system, the catheter further comprising:
a system connection portion fluidly connected to the fluid flow system and so positioned and arranged when in use to extend from outside of the patient upward into a peritoneal cavity of the patient;
an upper preformed non-linear portion fluidly connected to the system connection portion and having a fluid opening from the first lumen to the peritoneal cavity; and
a lower portion fluidly connected to and extending downward from the upper non-linear portion and having a fluid opening from the second lumen to the peritoneal cavity, wherein the upper preformed non-linear portion is connected to the lower portion by a substantially straight portion when in an unstressed condition.

Claim 54 (previously presented): The peritoneal dialysis system of claim 53, wherein the fluid flow system is a continuous flow dialysis system.

Claim 55 (previously presented): The peritoneal dialysis system of claim 53, wherein the fluid flow system is an automated continuous flow peritoneal dialysis system.

Claim 56 (previously presented): The peritoneal dialysis system of claim 53, wherein the catheter and the fluid openings to the first and second lumens are so positioned and arranged when in use in a peritoneal cavity that fluid flows out of the first lumen at an upper area of the peritoneal cavity and subsequently into the second lumen at an lower area of the peritoneal cavity.

Claim 57 (previously presented): The peritoneal dialysis system of claim 53, wherein the catheter further comprises a single tube having the first and second lumens.

Claim 58 (previously presented): The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion is a patient inflow portion, and the lower portion is a patient outflow portion, and wherein when the dialysis system is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

Claim 59 (canceled).

Claim 60 (previously presented): The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion has a non-linear shape in a section having the fluid opening to the first lumen.

Claim 61 (previously presented): The peritoneal dialysis system of claim 53, wherein the upper preformed non-linear portion has a generally inverted U shape.

Claims 62 to 73 (canceled)

Claim 74 (withdrawn): A method of performing peritoneal dialysis, comprising the steps of:

conveying the first and second fluid streams of dialysate through a catheter implanted in a peritoneal cavity;

causing the first fluid stream of dialysate to flow in a side-by-side arrangement relative to the second fluid stream of dialysate along at least a portion of the catheter;

allowing the first fluid stream of dialysate to flow out of the catheter and into an upper area of the peritoneal cavity; and

withdrawing fluid from a lower area of the peritoneal cavity into the catheter to form the second fluid stream of dialysate.

Claim 75 (withdrawn): The method of performing peritoneal dialysis of claim 74, further comprising the step of continuously flowing the dialysate to and from the catheter.

Claim 76 (withdrawn): The method of performing peritoneal dialysis of claim 74, further comprising the step of simultaneously conveying the first and second fluid streams of dialysate in opposite directions through the catheter.

Claim 77 (withdrawn): The method of performing peritoneal dialysis of claim 74, further comprising the step of conveying the first and second fluid streams of dialysate through a single tube catheter.

Claim 78 (withdrawn): A method of performing peritoneal dialysis on a patient, comprising the steps of:

flowing fluid through a first lumen of the single tube catheter and into an upper area of a peritoneal cavity of a patient; and

allowing fluid to enter a second lumen of the single tube catheter in a lower area of the peritoneal cavity and thereby flow out of the patient through the second lumen.

Claim 79 (withdrawn): The method of performing peritoneal dialysis of claim 78, further comprising the step of continuously conveying fluid to and from the single tube catheter with a peritoneal dialysis system.

Claim 80 (withdrawn): The method of performing peritoneal dialysis of claim 78, further comprising the conveying fluid simultaneously into and out of the patient's peritoneal cavity.

Claim 81 (withdrawn): The method of performing peritoneal dialysis of claim 78, further comprising the step of conveying fluid simultaneously in opposite directions through the first and second lumens of the single tube catheter.

Claim 82 (withdrawn): The method of performing peritoneal dialysis of claim 78, further comprising the step of conveying fluid through the first lumen in a side-by-side arrangement relative to the second lumen.

Claim 83 (withdrawn): A method of performing continuous flow peritoneal dialysis on a patient having a catheter implanted in a peritoneal cavity in which the catheter has portions including a first lumen arranged along side a second lumen, the method comprising the steps of:

- a) continuously flowing dialysis fluid through the first lumen of the catheter into an upper portion of the peritoneal cavity; and
- b) continuously flowing the dialysis fluid from a lower portion of the peritoneal cavity into the second lumen of the catheter away from the peritoneal cavity; and
- c) simultaneously performing steps a and b.

Claim 84 (withdrawn): The method of performing continuous flow peritoneal dialysis of claim 83, further comprising the step of continuously flowing the dialysis fluid through the first and second lumens with an automated peritoneal dialysis system.

Claim 85 (withdrawn): The method of performing continuous flow peritoneal dialysis of claim 83, further comprising the step of flowing the dialysis fluid through a single tube having the first and second lumens.

Claim 86 (withdrawn): The method of performing continuous flow peritoneal dialysis of claim 83, wherein the step of continuously flowing dialysis fluid through the first lumen further comprises flowing the dialysis fluid through a preformed non-linear portion of the catheter.

Claim 87 (withdrawn): A method of conveying dialysis fluid for use in performing peritoneal dialysis, the method comprising the steps of:

conveying dialysis fluid through a first implanted lumen of a catheter toward the peritoneal cavity;

allowing the dialysis fluid to exit the first implanted lumen through a preformed non-linear catheter portion and enter the peritoneal cavity;

allowing spent dialysis fluid to enter a second implanted lumen of the catheter;

conveying the dialysis fluid in the second implanted lumen away from the peritoneal cavity; and

conveying the dialysis fluid in the first implanted lumen along a flow path that is at least along portions of its length in a side-by-side arrangement to a flow path in the second implanted lumen.

Claim 88 (withdrawn): The method of conveying dialysis fluid of claim 87, wherein the method comprises continuously conveying the dialysis fluid through the first and second implanted lumens.

Claim 89 (withdrawn): The method of conveying dialysis fluid of claim 87, further comprising the step of conveying the dialysis fluid through the first and second lumens with an automated peritoneal dialysis system.

Claim 90 (withdrawn): The method of conveying dialysis fluid of claim 87, further comprising the step of conveying the dialysis fluid through a single tube having the first and second lumens.

Claim 91 (withdrawn): The method of conveying dialysis fluid of claim 87, further comprising the step of continuously allowing the dialysis fluid to flow from the first lumen into an upper area of the peritoneal cavity.

Claim 92 (withdrawn): The method of conveying dialysis fluid of claim 91, further comprising the step of continuously allowing the dialysis fluid to flow from a lower area of the peritoneal cavity into the second lumen.

Claim 93 (withdrawn): The method of conveying dialysis fluid of claim 87, further comprising the step of conveying the dialysis fluid through a longer flow path in the second lumen then a flow path in the first lumen.

Claim 94 (withdrawn): A method of providing dialysis comprising the steps of:
implanting a single tube catheter in a peritoneal cavity of a patient so that a first lumen of the catheter includes openings located in an upper portion of the peritoneal cavity and a second lumen of the catheter includes openings located in a lower portion of the peritoneal cavity.

Claims 95 to 98 (canceled)

Claim 99 (previously presented): A peritoneal dialysis catheter, comprising:
a tube having first and second lumens, the tube extending from an external proximal end to a single implantable free distal end; and
patient inflow and outflow portions spaced from each other along the tube, the patient in-flow portion having a preformed non-linear shape, and wherein the patient inflow portion is connected to the patient outflow portion by a substantially straight portion when in an unstressed condition.

Claim 100 (previously presented): The peritoneal dialysis catheter of claim 99, wherein the tube is so positioned and arranged when in use in a peritoneal cavity that fluid exits the catheter from the patient inflow portion to an upper area of the peritoneal cavity, flows across a portion of the peritoneal cavity, and re-enters the catheter at the patient outflow portion at a lower area of the peritoneal cavity.

Claim 101 (previously presented): The peritoneal dialysis catheter of claim 99, wherein the patient inflow portion is fluidly connected to the first lumen, and the patient outflow portion is fluidly connected to the second lumen, and wherein when the catheter is

in use, fluid simultaneously flows in opposite directions through the first and second lumens.

Claim 102 (canceled).

Claim 103 (previously presented): The peritoneal dialysis catheter of claim 99, wherein the patient inflow and outflow portions are located at opposite upper and lower portions of an implantable portion of the catheter.

Claim 104 (previously presented): The peritoneal dialysis catheter of claim 99, wherein the tube is a single tube having the first and second lumens.

Claim 105 (previously presented): A peritoneal dialysis catheter for use with a fluid flow system for conveying fluid to a peritoneal cavity of a patient, the catheter comprising:

first and second lumens;

a system connection portion which fluidly connects the first and second lumens to the fluid flow system, the system connection portion so positioned and arranged when in use to extend from outside of the patient upward into the peritoneal cavity of the patient;

an upper preformed non-linear portion fluidly connected to the system connection portion and having a fluid opening from the first lumen to the peritoneal cavity; and

a lower portion fluidly connected to and extending downward from the upper non-linear portion and having a fluid opening from the second lumen to the peritoneal cavity, wherein the upper preformed non-linear portion is connected to the lower portion by a substantially straight portion when in an unstressed condition.

Claim 106 (previously presented): The peritoneal dialysis catheter of claim 105, wherein the catheter and the fluid openings to the first and second lumens are so positioned and arranged when in use in a peritoneal cavity that fluid flows out of the first

lumen at an upper area of the peritoneal cavity and subsequently into the second lumen at an lower area of the peritoneal cavity.

Claim 107 (previously presented): The peritoneal dialysis catheter of claim 105, wherein the catheter further comprises a single tube having the first and second lumens.

Claim 108 (previously presented): The peritoneal dialysis catheter of claim 105, wherein the upper preformed non-linear portion is a patient inflow portion, and the lower portion is a patient outflow portion, and wherein when the peritoneal dialysis catheter is in use, fluid simultaneously flows in opposite directions through the first and second lumens.

Claim 109 (canceled).

Claim 110 (previously presented): A peritoneal dialysis catheter for use in a peritoneal cavity of a patient, the catheter comprising:

- an implantable portion;

- a first lumen extending through at least a portion of the implantable portion;

- a first fluid opening to the first lumen defined at a first location along the implantable portion;

- a second lumen having a different length than the first lumen and extending through at least a portion of the implantable portion; and

- a second fluid opening to the second lumen defined at a second location along the implantable portion different from the first location of the first fluid opening;

wherein the first and second lumens are so positioned and arranged when the implantable portion is implanted in the peritoneal cavity that the first lumen is side-by-side the second lumen and the fluid openings are at generally opposite portions of the peritoneal cavity.

Claim 111 (previously presented): The peritoneal dialysis catheter of claim 110, wherein the catheter is so constructed and arranged that fluid can flow simultaneously through the first and second lumens.

Claim 112 (previously presented): The peritoneal dialysis catheter of claim 110, wherein the catheter is so constructed and arranged that fluid can flow simultaneously in opposite directions through the first and second lumens.

Claim 113 (previously presented): The peritoneal dialysis catheter of claim 110, wherein the catheter further comprises a single tube having the first and second lumens.

Claim 114 (canceled).

Claim 115 (previously presented): The peritoneal dialysis catheter of claim 110, wherein the catheter is so positioned and arranged when in use in a peritoneal cavity that fluid flows across a substantial portion of the peritoneal cavity from the first lumen to the second lumen.